Reviewer HMB
cc:
Modeler
D.E.
File A0001120
IMP FID 26884

May 27, 2015

NSR Program Manager / Attn: O&G Production Facilities
Department of Environmental Quality
Air Quality Division
Herschler Building, 2-E
122 West 25th Street
Cheyenne, Wyoming 82002

RE: Linn Operating, Inc.
Air Permit Application – Stud Horse Butte 9o
Sublette County, Wyoming

Dear Program Manager:

Linn Operating, Inc. (Linn Energy) is pleased to submit the enclosed air quality permit application for a new multi-well pad facility, the Stud Horse Butte (SHB) 9o PAD. This application adheres to the requirements of Wyoming Air Quality Standards and Regulations (WAQSR) Chapter 6, Section 2 (C6 S2), and follows the Presumptive BACT permitting guidance for JPAD facilities, outlined in the Wyoming Air Quality Division (WAQD) Oil and Gas Production Facilities Permitting Guidance (September 2013).

The SHB 9o PAD is a new multi-well pad equipped with associated equipment typical for oil and gas production in the JPAD area. Table 1 provides a summary of the production rates for each well at the SHB 9o PAD.

Table 1:

Well Name	API Number	First Date of Production	Natural Gas Rate[1] (MMSCFD)	Condensate Rate[1] (BPD)
SHB 9o1	49-035-29340	2/25/2015	1.67	17.0
SHB 9j4	49-035-29342	2/24/2015	1.51	15.6

[1]Based on February 27-March 28, 2015 production

Since the first date of production, all production and control equipment identified in the enclosed application has been operating on the SHB 9o PAD. In accordance with current Division requirements, IMPACT forms have been completed and are included as part of this application package.

Estimated uncontrolled and controlled emission rates from the SHB 9o PAD are summarized in Table 2.

Table 2:

	VOCs	Total HAPs	NOx	CO
Uncontrolled (TPY)	50.5	15.3	0.1	0.1
Controlled (TPY)	1.9	0.2	0.5	0.2

As required under Wyoming Air Quality Standards and Regulations (WAQSR) Chapter 6, Section 2(c)(ii), Linn Energy submits this demonstration that the construction and use of the SHB 9o PAD will not prevent the attainment or maintenance of the Ozone Standard (75 ppb). As described in the Interim Policy (Issued July 21, 2008), Linn Energy will offset annual emissions of VOC at a ratio of 1.5:1 (i.e. 1 tpy VOC increase will be accompanied by a 1.5 tpy VOC reduction) and annual emissions of NOx will be

offset with a ratio of 1.1:1. Table 3 summarizes the ozone precursor offset quantities based on the estimated potential to emit from the SHB 9o PAD.

Table 3:

Ozone Precursor	Estimated Potential Emissions (TPY)	Offset Ratio	Offset Values (TPY)
NOx	0.5	1.1 to 1	0.55
VOC	1.9	1.5 to 1	2.85

Sufficient emission offset credits are available in Linn Energy's offset bank managed by the WAQD. Linn Energy requests that these offset credits (generated by voluntary NOx and VOC emissions projects within Sublette County) be used to offset the emissions expected to be generated while operating the SHB 9o PAD.

One paper copy with original signature and one electronic copy of this C6 S2 IMPACT application have been enclosed for your review.

Linn Operating appreciates your time and consideration in this matter. If you have any questions regarding this application submittal, please contact me at (307) 537-9622 or Craig Bock (SLR International) at (970) 817-4211.

Sincerely,

Keith Raney
Sr. EH&S Representative
Linn Operating, Inc.

Enclosure: C6, S2 Application Package

Department of Environmental Quality Air Quality Division

Permit Application Form

Is this a revision to an existing application?

Yes _____ No X

Previous Application #:

Date of Application: 5/27/2015

COMPANY INFORMATION:

Company Name: LINN OPERATING, INC.

Address: 81 LUMEN ROAD, BOX 254

City: BOULDER State: WY Zip Code: 82923

Country: USA Phone Number: (307) 537 - 9622

FACILITY INFORMATION:

Facility Name: Stud Horse Butte 9o Pad

New Facility or Existing Facility: NEW

Facility Description: OIL AND GAS PRODUCTION MULTI-WELL PAD

Facility Class: MINOR Operating Status: OPERATING

Facility Type: PRODUCTION SITE

For Oil & Gas Production Sites ONLY:

First Date of Production (FDOP)/Date of Modification: 2/27/2015

Does production at this facility contain H2S?* NO

If yes, contact the Division.

API Number(s): New Wells:

Name: SHB 9 o1 API #: 49-035-29340

Name: SHB 9 j4 API #: 49-035-29342

Name:

Name:

NAICS Code: 21111 OIL AND GAS EXTRACTION

FACILITY LOCATION:

***Enter the facility location in either the latitude/longitude area or section/township/range area. Both are not required.**

Physical Address:

City: Zip Code:

State: WY County:

OR

Latitude: 42.49224 Longitude: -109.722458 County: SUBLETTE

Quarter Quarter: SW/SW Quarter:

Section: 9 Township: 29N Range: 108W

For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)

CONTACT INFORMATION:

***Note that an Environmental AND NSR Permitting Contact is required for your application to be deemed complete by the agency.**

Title: MR. First Name: KEITH

Last Name: RANEY

Company Name: LINN OPERATING, INC.

Job Title: SR. EH&S REPRESENTATIVE

Address: 81 LUMEN ROAD, BOX 254

City: BOULDER State: WY

Zip Code: 82923

Primary Phone No.: (307) 537 - 9622 E-mail: KRANEY@LINNENERGY.COM

Mobile Phone No.: (307) 749 - 0458 Fax No.:

Contact Type: REPRESENTATIVE Start Date:

Additional Contact Type (if needed):

Title: MR. First Name: CRAIG

Last Name: BOCK

Company Name: SLR INTERNATIONAL CORPORATION

Job Title: SR. PROJECT ENGINEER

Address: 1334 S. 2ND AVE

City: POCATELLO State: ID

Zip Code: 83201

Primary Phone No.: (907) 817-4211 E-mail: CBOCK@SLRCONSULTING.COM

Mobile Phone No.: (907) 817-4211 Fax No.:

Contact Type: CONSULTANT Start Date:

FACILITY APPLICATION INFORMATION:

General Info:

Has the facility changed location or is it a new/ greenfield facility?	YES
Has a Land Use Planning document been included in this application?	NO
Is the facility located in a sage grouse core area?*	NO
If the facility is in a sage grouse core area, what is the WER number?	

** For questions about sage grouse core area, contact WY Game & Fish Department.*

Federal Rules Applicability - Facility Level:

Prevention of Significant Deterioration (PSD):	NO
Non-Attainment New Source Review:	NO

Modeling Section:

Has the Air Quality Division been contacted to determine if modeling is required?	N/A
Is a modeling analysis part of this application?	N/A
Is the proposed project subject to Prevention of Significant Deterioration (PSD) requirements?	NO
Has the Air Quality Division been notified to schedule a pre-application meeting?	NO
Has a modeling protocol been submitted to and approved by the Air Quality Division?	N/A
Has the Air Quality Division received a Q/D analysis to submit to the respective FLMs to determine the need for an AQRV analysis?	NO

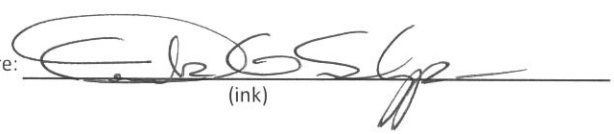
Required Attachments:

Facility Map	☑
Process Flow Diagram	☑
Modeling Analysis (if applicable)	☐
Land Use Planning Document	☐
Detailed Project Description	☑
Emissions Calculations	☑

I, Derek Schupp — Responsible Official (Printed Name)

PRODUCTION SUPERINTENDENT — Title

an Official Representative of the Company, state that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief. I further certify that the operational information provided and emission rates listed on this application reflect the anticipated emissions due to the operation of this facility. The facility will operate in compliance with all applicable Wyoming Air Quality Standards and Regulations.

Signature:  (ink)

Date: 5-27-15

Stud Horse Butte 9o PAD

IMPACT Forms

Specific Emission Unit Attributes:

Dehydration Unit

Company Equipment ID: DEHY1

Company Equipment Description: One (1) 6.0 MMSCFD TEG Dehydration Unit used to dry wellhead gas to meet pipeline specifications

Operating Status: Operating

Initial Construction Commencement Date:

Initial Operation Commencement Date: 2/27/2015

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: New facility/equipment

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Dehydration Type: TEG

Design Capacity (MMscf/day): 6

Temperature of Wet Gas (F): 65

Water Content of Dry Gas (lbs H2O/MMscf): 2.5

Pressure of Wet Gas (psig): 250

Manufacturer Name of Glycol Circulation Pump: Kimray

Model Name and Number of Glycol Circulation Pump: 2 qty. (used simultaneously) - 2015 SC TEG Pumps

Water Content of Wet Gas (lbs H2O/MMscf): Saturated

Flow Rate of Dry Gas (MMscfd): 1.91

Type of Glycol Circulation Pump: Gas

Pump Volume Ratio (acfm/gpm): 0.08

Actual LEAN Glycol Circulation Rate (gpm): 0.67 (0.33 gpm each pump)

Maximum LEAN Glycol Circulation Rate (gpm): 0.67 (0.33 gpm each pump)

Source of Motive Gas for Pump: Field gas at dehydrator

Include Glycol Flash Separator?: No

Flash Tank Off Gas Stream (scf/hr): N/A

Flash Tank Operating Temperature (F): N/A

Flash Tank Operating Pressure (psig): N/A

Where are Flash Vapors Routed?: SCC1

Is Vessel Heated?: Yes

Additional Gas Stripping?: No

Stripping Gas Rate (scf/min): N/A

Source of Stripping Gas: N/A

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-003-01

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: 24

Hours/year: 8760

Control Equipment: Yes - Condenser & Enclosed Combustor (SCC1)

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Heater/Chiller

Company Equipment ID: **REB1**

Company Equipment Description: **One (1) 0.125 MMBtu/hr Dehy Reboiler Heater associated with DEHY1**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Firing Type: **Indirect**

Heat Input Rating: **0.125** Units: **MMBtu/hr**

Primary Fuel Type: **Field Gas**

Secondary Fuel Type: **N/A**

Heat Content of Fuel: **1113** Units: **BTU/scf**

Fuel Sulfur Content: **0** Units: **%**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-004-05

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Flare/Combustor - 1

Company Equipment ID: **SCC1**

Company Equipment Description: **One (1) Enclosed Smokeless Combustion Chamber for Dehy Control**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Maximum Design Capacity (MMSCF/hr): **22 MSCF/D or 0.916 MSCF/hr**

Minimum Design Capacity (MMSCF/hr):

Pilot Gas Volume (scf/min): **1.5**

Emergency Flare Only: **No**

Ignition Device Type: **Pilot**

Btu Content (Btu/scf): **1113**

Smokeless Design: **Yes**

Assist Gas Utilized? **No**

Continuously Monitored? **Yes - Pilot Only**

Waste Gas Volume: **76**

Units: **scf/hr**

Installation Date: **2015**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-05

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Flare/Combustor - 2

Company Equipment ID: **SCC2**

Company Equipment Description: **One (1) Enclosed Smokeless Combustion Chamber for Tank , LPS and Pneumatic Pump Control**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Maximum Design Capacity (MMSCF/hr): **13.54 MSCF/hr or 325,000 SCFD**

Minimum Design Capacity (MMSCF/hr):

Pilot Gas Volume (scf/min): **1.6**

Emergency Flare Only: **No**

Ignition Device Type: **Pilot**

Btu Content (Btu/scf): **1456**

Smokeless Design: **Yes**

Assist Gas Utilized? **No**

Continuously Monitored? **Yes - Pilot Only**

Waste Gas Volume: **148**

Units: **scf/hr**

Installation Date: **2015**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-05

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: **Slug Catcher**

Company Equipment Description: **One (1) Two-Phase High Pressure Separator associated with the SHB 9-o1 and SHB 9-j4 wells.**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Type of Vessel: **2-Phase Separator**

Is Vessel Heated? **No**

Operating Temperature (F): **70**

Operating Pressure (psig): **250**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Separator/Treater

Company Equipment ID: **LPS**

Company Equipment Description:

One (1) Low Pressure Separator

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Type of Vessel: **3-Phase Separator**

Is Vessel Heated? **Yes**

Operating Temperature (F): **70**

Operating Pressure (psig): **30**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-001-07

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: Yes - Enclosed Combustor (SCC2)

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Heater/Chiller

Company Equipment ID: **EGH1**

Company Equipment Description: **One (1) 0.25 MMBtu/hr Ethylene Glycol Bath Heater**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Firing Type: **Indirect**

Heat Input Rating: **0.250** Units: **MMBtu/hr**

Primary Fuel Type: **Field Gas**

Secondary Fuel Type: **N/A**

Heat Content of Fuel: **1113** Units: **BTU/scf**

Fuel Sulfur Content: **0** Units: **%**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-004-05

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **4380**

Control Equipment: No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Pneumatic Equipment (Pumps and Controllers)

Company Equipment ID: **P3-P4**

Company Equipment Description: **Two (2) 321 scfh Natural Gas Pneumatic Heat Trace EG Pumps**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Type of Equipment: **Pump**

Motive Force: **Field Gas**

VOC Content (%): **9.61%**

HAP Content (%): **0.76%**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **4380**

Control Equipment: Yes - Enclosed Combustor (SCC1)

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Loading/Unloading/Dump

Company Equipment ID: **TCK**

Company Equipment Description: **Condensate Truck Loading from Storage Tanks**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Type of Material: **Liquid**

Material Description: **Natural Gas Condensate**

Maximum Annual Throughput:	**7,147**	Units:	**barrels/yr**
Maximum Hourly Throughput:	**0.82**	Units:	**barrels/hr**

Detailed Description of Loading/Unloading/Dump Source:

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Fugitives

Company Equipment ID: **FUG**

Company Equipment Description: **Equipment Fugitive Leaks - All Equipment (Valves, Flanges, Connections, Seals, Drains)**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Type of Fugitive Emission: **Fugitive Leaks at O&G**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-20

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60-Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Pneumatic Equipment (Pumps and Controllers)

Company Equipment ID: **Liquid Level Controllers**

Company Equipment Description: **Five (5) Low or No-bleed Pneumatic Controllers**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Type of Equipment: **Controller**

Motive Force: **Field Gas**

VOC Content (%): **9.61%**

HAP Content (%): **0.76%**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-003-24

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: No

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: **T1-T2**
Company Equipment Description: **Two (2) 400-bbl Condensate Storage Tanks**

Operating Status: **Operating**
Initial Construction Commencement Date:
Initial Operation Commencement Date: **2/27/2015**
Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Material Type: **Liquid**
Description of Material Stored: **Condensate from Natural Gas Production**

Capacity: **800 (T1-T2 Combined)** Units: **barrels**
Maximum Throughput: **19.58** Units: **barrels/day**
Maximum Hourly Throughput: **0.82** Units: **barrels/hr**
Operating Pressure (psig): **Atmospheric**
Vapor Pressure of Material Stored (psig): **N/A**
Is Tank Heated?: **No**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.
Hours/day: **24**
Hours/year: **8760**

Control Equipment: Yes - Enclosed Combustor (SCC2)

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Specific Emission Unit Attributes:

Storage Tank/Silo

Company Equipment ID: **T3**

Company Equipment Description: **One (1) 400-bbl Produced Water Storage Tank**

Operating Status: **Operating**

Initial Construction Commencement Date:

Initial Operation Commencement Date: **2/27/2015**

Most Recent Construction/ Modification Commencement Date:

Most Recent Operation Commencement Date:

Select reason(s) for this emissions unit being included in this application (must be completed regardless of date of installation or modification):

Reason: **New facility/equipment**

If reason is ***Reconstruction*** or ***Temporary Permit*** or ***Other,*** please explain below:

New facility

Material Type: **Liquid**

Description of Material Stored:

Produced Water from Natural Gas Production

Capacity: **400** Units: **barrels**

Maximum Throughput: **120.90** Units: **barrels/day**

Maximum Hourly Throughput: **5.04** Units: **barrels/hr**

Operating Pressure (psig): **Atmospheric**

Vapor Pressure of Material Stored (psig): **N/A**

Is Tank Heated?: **No**

SCC Codes: List all Source Classification Code(s) (SCC) that describe the process(es) performed by the emission source (e.g., 1-02-002-04).

3-10-002-99

Potential Operating Schedule: Provide the operating schedule for this emission unit.

Hours/day: **24**

Hours/year: **8760**

Control Equipment: Yes - Enclosed Combustor (SCC2)

If yes, please fill out and attach the appropriate Control Device and Release Point Information worksheets.

Best Available Control Technology (BACT): Was a BACT Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed BACT: **Presumptive**

*If yes, attach BACT Analysis with this application.

Lowest Achievable Emission Rate (LAER): Was a LAER Analysis completed for this emission unit?

☐ Yes ☑ **No**

Pollutant: _____

Proposed LAER: _____

*If yes, attach LAER Analysis with this application.

Federal and State Rule Applicability:

New Source Performance Standards (NSPS): **Not Affected**

New Source Performance Standard are listed under 40 CFR 60- Standards of Performance for New Stationary Sources.

NSPS Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61): **Not Affected**

National Emissions Standards for Hazardous Air Pollutants (NESHAP Part 61) are listed under 40 CFR 61. (These include asbestos, benzene, beryllium, mercury, and vinyl chloride).

Part 61 NESHAP Subpart: _____

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63): **Not Affected**

National Emission Standards for Hazardous Air Pollutants (NESHAP Part 63) standards are listed under 40 CFR 63

Part 63 NESHAP Subpart: _____

Prevention of Significant Deterioration (PSD): **Not Affected**

These rules are found under WAQSR Chapter 6, Section 4.

Non-Attainment New Source Review: **Not Affected**

These rules are found under WAQSR Chapter 6, Section 13.

Control Equipment:

Condenser

Manufacturer:	**Various Fabricators**	Date Installed:	**2015**
Model Name and Number:	**N/A**	Company Control Equipment ID:	**DEHY1 Cond.**
Company Control Equipment Description:	**Still vent condenser for DEHY1 (Vents to SCC1)**		

Pollutant(s) Controlled:	☐ CO	☐ NOx	☐ Pb	☐ SO2	☑ VOC	☐ PM
☐ PM (FIL)	☐ PM Condensible	☐ PM 10 (FIL)	☐ PM 2.5 (FIL)	☐ PM 10	☐ PM 2.5	
☑ **Other: HAPs**						

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Design Control Efficiency (%):	**98**	Capture Efficiency (%):	**100**
Operating Control Efficiency (%):	**98**		
Condenser Type:*	**Indirect Contact**		
Coolant Type:*	**Atmospheric air**		
Design Coolant Temp. Range (F):	**N/A**		
Design Coolant Flow Rate (gpm):	**N/A**		
Max. Exhaust Gas Temp (F):		Inlet Gas Flow Rate (acfm):	**10.89**
Outlet Gas Flow Rate (acfm):	**1.83**	Inlet Gas Temp (F):	**212**
Operating Pressure (psia):	**13.20**	Outlet Gas Temp (F):	**78**

☐ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☑ Primary ☐ Secondary ☐ Parallel

List all other emission units that are also vented to this control equipment:* **None**

List all release point IDs associated with this control equipment:* **TBD - associated with release point SCC1**

Control Equipment:

Flare/Combustor

Manufacturer: **Various Fabricators**
Date Installed: **2015**
Model Name and Number:
Company Control Equipment ID: **SCC1 Control**
Company Control Equipment Description: **Enclosed Smokeless Combustion Chamber - DEHY1 Condenser Control**

Pollutant(s) Controlled:
☐ CO ☐ NOx ☐ Pb ☐ SO2 ☑ **VOC** ☐ PM
☐ PM (FIL) ☐ PM Condensible ☐ PM 10 (FIL) ☐ PM 2.5 (FIL) ☐ PM 10 ☐ PM 2.5
☑ **Other: HAPs**

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Maximum Design Capacity (MMSCF/hr): **22 MSCF/D or 0.916 MSCF/hr**
Minimum Design Capacity (MMSCF/hr):
Design Control Efficiency (%): **98** Capture Efficiency (%): **100**
Operating Control Efficiency (%): **98**
Flare Type:* **Enclosed** **Elevated Flare Type:*** **Non-Assisted**
Ignition Device:* **Yes** **Flame Presence Sensor:*** **Yes**
Inlet Gas Temp (F): **78** **Flame Presence Type:*** **Thermocouple**
Gas Flow Rate (acfm): **693.1** Outlet Gas Temp (F): **1200**

☐ This is the only control equipment on this air contaminant source
If not, this control equipment is: ☑ Primary ☑ Secondary ☐ Parallel

List all other emission units that are also vented to this control equipment:* **DEHY1 (primary control)**

List all release point IDs associated with this control equipment:* **None**

Control Equipment:

Flare/Combustor

Manufacturer: **Various Fabricators**

Date Installed: **2015**

Model Name and Number:

Company Control Equipment ID: **SCC2 Control**

Company Control Equipment Description: **Enclosed Smokeless Combustion Chamber - Tank Vent, LPS, and Pneumatic Pump P3-P4 Vent Control**

Pollutant(s) Controlled:

☐ CO	☐ NOx	☐ Pb	☐ SO2	☑ VOC	☐ PM	☐ PM (FIL)	☐ PM Condensible	☐ PM 10 (FIL)	☐ PM 2.5 (FIL)	☐ PM 10	☐ PM 2.5

☑ **Other: HAPs**

NOTE: The following fields require numeric values unless otherwise denoted with an asterisk*

Maximum Design Capacity (MMSCF/hr): **13.54 MSCF/hr or 325,000 SCFD**

Minimum Design Capacity (MMSCF/hr):

Design Control Efficiency (%): **98**

Capture Efficiency (%): **100**

Operating Control Efficiency (%): **98**

Flare Type:* **Enclosed**

Elevated Flare Type:* **Non-Assisted**

Ignition Device:* **Yes**

Flame Presence Sensor:* **Yes**

Inlet Gas Temp (F): **70**

Flame Presence Type:* **Thermocouple**

Gas Flow Rate (acfm): **2665.8**

Outlet Gas Temp (F): **1200**

☑ This is the only control equipment on this air contaminant source

If not, this control equipment is: ☐ Primary ☐ Secondary ☐ Parallel

List all other emission units that are also vented to this control equipment:* **T1-T3, LPS, P3-P4**

List all release point IDs associated with this control equipment:* **None**

Release Point Information:

Complete the table below for ***each*** release point. Please include release point information for each emission unit. Multiple attachments may be necessary. A release point is a point at which emissions from an emission unit are released into the ambient (outside)air. List each individual release point on a separate pair of lines (release point ID and description). ***For longitude and latitude, use NAD 83/WGS84 datum and 5 digits after the decimal (i.e. 41.12345, -107.56789)***

Stack Release Point Information		
Company Release Point ID:	Release Point Type:	Vertical
TBD	Release Point Latitude:	42.49224
	Release Point Longitude:	-109.722458
Company Release Point Description:	Base Elevation (ft):	7217
SCC1: Enclosed smokeless combustion chamber to control dehydrator condenser vents from DEHY1.	Stack Height (ft):	23
	Stack Diameter (ft):	2
	Exit Gas Velocity (ft/s):	5.3
	Exit Gas Temp (F):	1,200
	Exit Gas Flow Rate (acfm):	693.1
Company Release Point ID:	Release Point Type:	Vertical
TBD	Release Point Latitude:	42.49224
	Release Point Longitude:	-109.722458
Company Release Point Description:	Base Elevation (ft):	7217
SCC2: Enclosed smokeless combustion chamber to control tank vents (T1-T3), LPS Vent and pneumatic pump vents from P3-P4.	Stack Height (ft):	20
	Stack Diameter (ft):	4
	Exit Gas Velocity (ft/s):	3.5
	Exit Gas Temp (F):	1,200
	Exit Gas Flow Rate (acfm):	2665.84
Company Release Point ID:	Release Point Type:	Vertical
TBD	Release Point Latitude:	42.49224
	Release Point Longitude:	-109.722458
Company Release Point Description:	Base Elevation (ft):	7217
REB1: Reboiler Heater (0.125 MMBtu/hr) associated with DEHY1.	Stack Height (ft):	12
	Stack Diameter (ft):	0.50
	Exit Gas Velocity (ft/s):	2.12
	Exit Gas Temp (F):	500
	Exit Gas Flow Rate (acfm):	24.94
Company Release Point ID:	Release Point Type:	Vertical
TRK	Release Point Latitude:	42.49224
	Release Point Longitude:	-109.722458
Company Release Point Description:	Base Elevation (ft):	7217
Truck load-out of condensate	Stack Height (ft):	varies, top of truck
	Stack Diameter (ft):	varies, size of vent
	Exit Gas Velocity (ft/s):	variable, depends on pump rate
	Exit Gas Temp (F):	variable
	Exit Gas Flow Rate (acfm):	variable

Company Release Point ID:	Release Point Type:	Vertical
TBD	Release Point Latitude:	**42.49224**
	Release Point Longitude:	**-109.722458**
Company Release Point Description:	Base Elevation (ft):	**7217**
EGH1: Ethylene Glycol Bath Heater (0.25 MMBtu/hr) for equipment and line heat tracing.	Stack Height (ft):	**12**
	Stack Diameter (ft):	**0.50**
	Exit Gas Velocity (ft/s):	**4.24**
	Exit Gas Temp (F):	**500.00**
	Exit Gas Flow Rate (acfm):	**49.89**

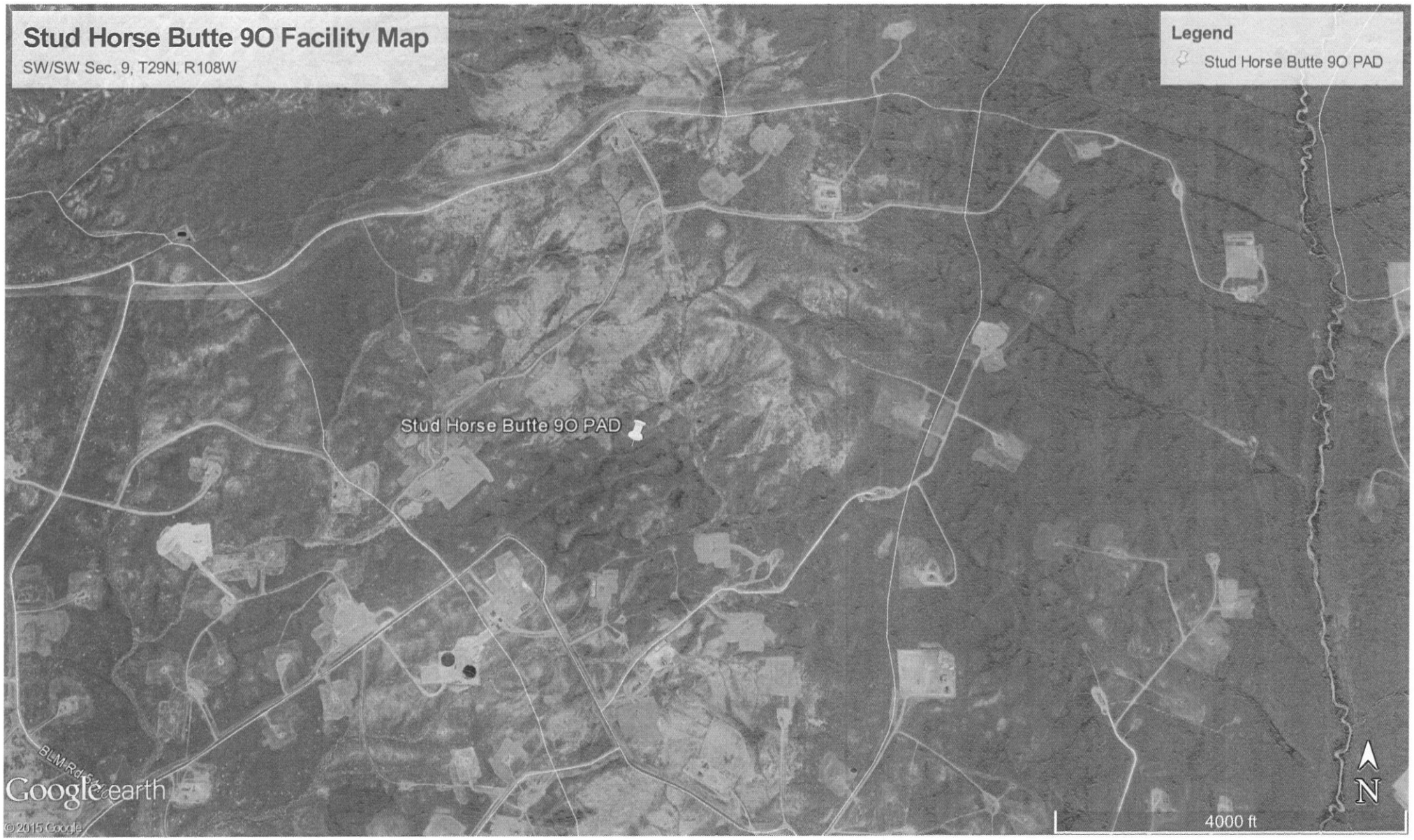
Company Release Point ID:	Release Point Type:	Vertical
TBD	Release Point Latitude:	**42.49224**
	Release Point Longitude:	**-109.722458**
Company Release Point Description:	Base Elevation (ft):	**7217**
Liquid Level Controllers (6 Total)	Stack Height (ft):	
	Stack Diameter (ft):	
	Exit Gas Velocity (ft/s):	
	Exit Gas Temp (F):	
	Exit Gas Flow Rate (acfm):	

Complete the table below for each fugitive (area, volume, line) release point. List each individual release point on a separate line.

Fugitive Release Point Information		
Company Release Point ID:	Release Point Latitude:	**42.49224**
TBD	Release Point Longitude:	**-109.722458**
	Release Height (ft):	**7217**
Company Release Point Description:		
Fugitive leaks from valves, flanges, and other connectors located on entire site.		

Stud Horse Butte 9o PAD

Facility Map, Process Description, & Process Flow Diagram


Stud Horse Butte 9O Facility Map
SW/SW Sec. 9, T29N, R108W
Legend
Stud Horse Butte 9O PAD
Stud Horse Butte 9O PAD
BLM Rd
Google earth
© 2015 Google
4000 ft
N

PROCESS DESCRIPTION

The Stud Horse Butte (SHB) 9o PAD facility is a new multi-well PAD located in the Jonah and Pinedale Anticline (JPAD) that currently receives production from two wells, SHB 9o1 and SHB 9j4. The SHB 9o PAD process and equipment is visually depicted in the process flow diagram that follows this description of the process.

The SHB 9o PAD consists of one (1) production train consisting of one (1) two phase high pressure separator, one (1) low pressure separator equipped with one (1) EG bath coil heater, and one (1) natural gas dehydrator. The production train is designed to produce two (2) production wells in parallel. The well stream from each individual well is combined and routed through a high-pressure 2-phase separator, separating the stream into wet gas, and liquids (condensate and water).

The liquids from the high-pressure separator are then routed to a 3-phase low pressure separator where the stream is further separated into gas, condensate and water. The gas from the low pressure separator is sent to an enclosed smokeless combustor (SSC2). The condensate and produced water exit the low pressure separator as follows:

> The condensate (hydrocarbon liquid) flows to condensate storage tanks. As the pressurized hydrocarbon liquids are transferred from the separators to the storage tanks, the flash gas that is generated is vented to an enclosed smokeless combustor (SCC2); as are all standing, working, and breathing losses (S/W/B) from the condensate tanks. After an adequate volume of condensate is accumulated in the tanks, the condensate is loaded into a tank truck and transported to a processing facility.
>
> The produced water is transferred from the separators to the produced water storage tank. Any potential standing, working, and breathing (S/W/B) losses that may occur from the produced water tank are also vented to the same enclosed combustor (SCC2) as the condensate tanks. After an adequate volume of produced water is accumulated in the tank, the produced water is loaded into a tank truck and transported to an appropriate treatment or disposal facility.

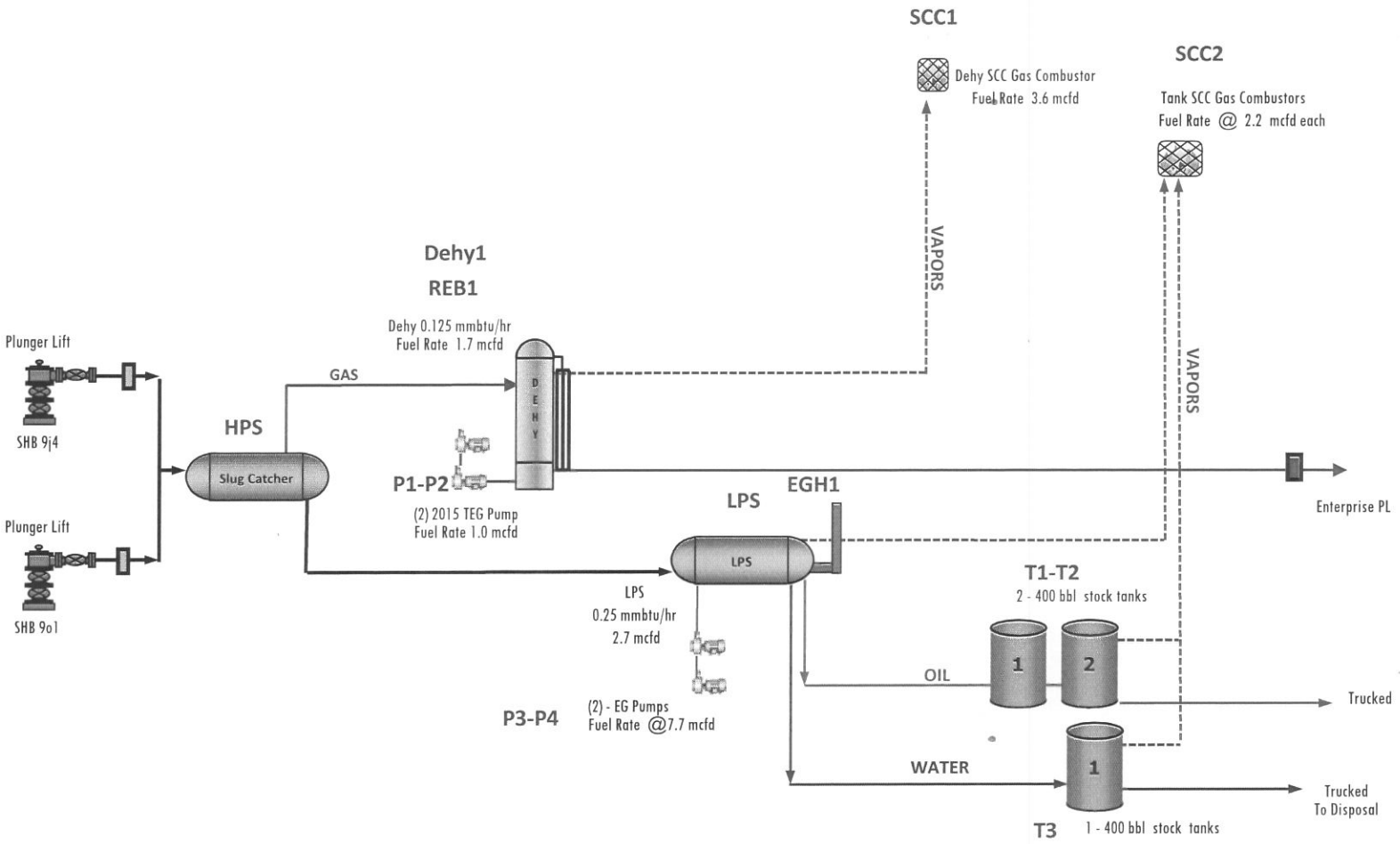
Wet gas from the high-pressure 2-phase separator is routed to the TEG dehydration unit onsite (DEHY1), which dries the gas to sales pipeline specifications.

For the dehydration unit:

> Wet gas enters a two phase separator, to remove any liquids which have condensed in the transfer system. The separated gas stream then enters the absorber where it contacts lean glycol to remove the water vapor from the gas stream to a concentration determined by the sales contract, the resultant dry gas is measured and routed to the natural gas sales pipeline. From the absorber tower, the rich glycol (glycol saturated with water) is regenerated in a glycol reboiler, which distills the water from the rich glycol, the resultant lean glycol is suitable for reuse, and is subsequently re-circulated back into the absorber tower.
>
> During the absorption process, hazardous air pollutants (HAPs) including benzene, toluene, ethyl benzene, and xylene (BTEX), hexanes and volatile organic compounds (VOCs) are absorbed in the lean glycol stream along with the water vapors, and subsequently purged from solution during the reboiler regeneration process. The reboiler still vent vapors from the TEG dehydration unit are routed through a condenser and then piped to an enclosed smokeless combustor (SCC1) for destruction of vapors.

Stud Horse Butte 9o PAD
- Facility Equipment Drawing -

Effective February 2015



UPDATE SUMMARY:
New location
(DC)

GAS METER — GAS LINE
OIL METER — OIL LINE
WATER METER — WATER LINE
WET GAS METER — PNEUMATIC CHEMICAL PUMP (GAS)

Stud Horse Butte 9o PAD

Emission Calculations

STATE OF WYOMING

Department of Environmental Quality - Air Quality Division
Oil and Gas Production Facilities C6 S2 Permit Application

EMISSION SUMMARY

Company Name LINN OPERATING, INC.

Facility Name Stud Horse Butte 9o Pad

This form must be completed for each emission source at the facility. A list of the emission sources which must be considered is found in Appendix B of the C6 S2 O&G Production Facilities Permitting Guidance.

UNCONTROLLED EMISSIONS (Tons Per Year)

These are the total uncontrolled, potential emissions from each source.

EMISSION SOURCE (i.e., tank, natural gas-fired heater, reboiler still vent, glycol flash separator, pneumatic pump, separator gas vent, water knockout vent, etc.)	VOCs	total HAPs	NO_X	CO	SO_2	H_2S
6.0 MMSCFD TEG Dehydration Unit (DEHY1)	20.23	13.31	0.00	0.00	0.00	0.00
Condensate Tanks (T1-T2)	9.65	0.53	0.00	0.00	0.00	0.00
Produced Water Tank (T3)	0.25	0.02	0.00	0.00	0.00	0.00
DEHY1 SCC (SCC1)	0.00	0.00	0.00	0.00	0.00	0.00
LPS/Tank/P3-P4 (SCC2)	0.00	0.00	0.00	0.00	0.00	0.00
Process Heaters (REB1, EGH1)	0.01	0.00	0.11	0.09	0.00	0.00
Pneumatic Pumps (P3-P4)	6.40	0.51	0.00	0.00	0.00	0.00
Truck Loading (TCK)	0.48	0.01	0.00	0.00	0.00	0.00
Fugitives (FUG)	0.69	0.07	0.00	0.00	0.00	0.00
Liquid Level Controllers	0.03	0.002	0.00	0.00	0.00	0.00
Low Pressure Separator (LPS)	12.80	0.87	0.00	0.00	0.00	0.00
Totals	**50.5**	**15.3**	**0.1**	**0.1**	**0.0**	**0.0**

CONTROLLED EMISSIONS (Tons Per Year)

These are the total emissions from each source. Include controlled emissions from each controlled source and uncontrolled emissions from each source which does not require control, such as process equipment burners.

EMISSION SOURCE	VOCs	total HAPs	NO_X	CO	SO_2	H_2S
6.0 MMSCFD TEG Dehydration Unit (DEHY1)	0.00	0.00	0.00	0.00	0.00	0.00
Condensate Tanks (T1-T2)	0.00	0.00	0.00	0.00	0.00	0.00
Produced Water Tank (T3)	0.00	0.00	0.00	0.00	0.00	0.00
DEHY1 SCC (SCC1)	0.12	0.06	0.11	0.03	0.00	0.00
LPS/Tank/P3-P4 (SCC2)	0.58	0.04	0.25	0.06	0.00	0.00
Process Heaters (REB1, EGH1)	0.01	0.00	0.11	0.09	0.00	0.00
Pneumatic Pumps (P3-P4)	0.00	0.00	0.00	0.00	0.00	0.00
Truck Loading (TCK)	0.48	0.01	0.00	0.00	0.00	0.00
Fugitives (FUG)	0.69	0.07	0.00	0.00	0.00	0.00
Liquid Level Controllers	0.03	0.0022	0.00	0.00	0.00	0.00
Low Pressure Separator (LPS)	0.00	0.00	0.00	0.00	0.00	0.00
Totals	**1.9**	**0.2**	**0.5**	**0.2**	**0.0**	**0.0**

HAZARDOUS AIR POLLUTANT SUMMARY (Tons Per Year)

Complete this section for each emissions source if TOTAL HAPs from that source are 9 TPY or greater.

SOURCE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Other

LINN OPERATING, INC.
Total Well Production

Facility Name	Stud Horse Butte 9O Pad

Production Timeframe [1]	Well Name	Oil Bbls[1]	Gas Mcf[1]	Produced Water [1]	Days	Gas (MMSCF/day)	Oil (BPD)
2/27/2015-3/28/2015	SHB 9 O1	511	50,163	1,883	30	1.67	17.0
2/27/2015-3/28/2015	SHB 9 J4	468	45,289	1,744	30	1.51	15.6
Totals		**979**	**95,452**	**3,627**		**3.2**	**32.6**

Estimated Production/Dehy Unit	
Dehys	**MMSCFD**
6.0	1.91

Pad Production Rates - New Wells; ~30 day production * 0.6 decline factor	
Gas MMSCFD	**Oil (BPD)**
1.91	19.58

Totals	
Gas (MMSCFD)	**Oil (BPD)**
1.91	**19.58**

References

[1] Actual first 30-day production data obtained from Linn database.

LINN OPERATING, INC.
SCC1 - Dehy & Combustor Emission Calculations

Emission Assumptions

		NOx Emission Factor =	0.14	lb/MMBtu	WDEQ O&G Guidance
		CO Emission Factor =	0.035	lb/MMBtu	WDEQ O&G Guidance
SCC1	DEHY1 (6.0 MM)	Combustor Waste Gas Throughput =	76	scf/hr	[Gas Throughput from GlyCalc Model]
		Combustor Pilot Gas =	92	scf/hr	[Conservative estimate]
		Natural Gas Heating Value =	1113	Btu/scf	[Field Average]

			NOx (tpy)	CO (tpy)	Number of Units	
SCC1	DEHY1 (6.0 MM)	Combustor Emissions =	0.05	0.01	1	
		Pilot Gas Emissions =	0.06	0.02	1	**Number of Dehy Combustors**
		Total Combustor Emissions =	**0.11**	**0.03**		

Notes:

Emission factors for NOx and CO from combustors from WDEQ O&G Guidance, March 2010

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: SHB 9O Pad Dehy
File Name: N:\Fort Collins\Linn Energy Official\Permitting\SHB 9o PAD\Calcs\Glycalc\SHB 9O.ddf
Date: May 18, 2015

DESCRIPTION:

Description: Linn Operating, Inc.
SHB 9O Pad
One (1) Dehys - 6 MMSCFD with two (2) 2015
glycol pumps (operating simultaneously)

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0509	1.221	0.2229
Ethane	0.0062	0.150	0.0273
Propane	0.0038	0.090	0.0165
Isobutane	0.0016	0.038	0.0069
n-Butane	0.0018	0.042	0.0077
Isopentane	0.0010	0.024	0.0045
n-Pentane	0.0009	0.020	0.0037
n-Hexane	0.0017	0.041	0.0074
Cyclohexane	0.0014	0.033	0.0060
Heptanes	0.0015	0.035	0.0064
Methylcyclohexane	0.0021	0.051	0.0093
2,2,4-Trimethylpentane	<0.0001	0.001	0.0002
Benzene	0.0052	0.125	0.0227
Toluene	0.0059	0.142	0.0259
Ethylbenzene	0.0001	0.002	0.0004
Xylenes	0.0011	0.026	0.0047
C8+ Heavies	<0.0001	<0.001	0.0001
Total Emissions	0.0851	2.042	0.3726
Total Hydrocarbon Emissions	0.0851	2.042	0.3726
Total VOC Emissions	0.0280	0.671	0.1225
Total HAP Emissions	0.0140	0.336	0.0613
Total BTEX Emissions	0.0123	0.294	0.0537

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	2.5454	61.090	11.1489
Ethane	0.3125	7.501	1.3689
Propane	0.1918	4.602	0.8399
Isobutane	0.0813	1.952	0.3562
n-Butane	0.0927	2.224	0.4060
Isopentane	0.0606	1.455	0.2655
n-Pentane	0.0491	1.178	0.2150
n-Hexane	0.1344	3.226	0.5888
Cyclohexane	0.1263	3.032	0.5533
Heptanes	0.2008	4.819	0.8794
Methylcyclohexane	0.3046	7.311	1.3342
2,2,4-Trimethylpentane	0.0065	0.156	0.0284
Benzene	0.5549	13.318	2.4305
Toluene	1.3792	33.100	6.0407
Ethylbenzene	0.0700	1.681	0.3067
Xylenes	0.8927	21.425	3.9101
C8+ Heavies	0.4733	11.360	2.0732
Total Emissions	7.4762	179.428	32.7457
Total Hydrocarbon Emissions	7.4762	179.428	32.7457
Total VOC Emissions	4.6182	110.838	20.2279
Total HAP Emissions	3.0377	72.905	13.3052
Total BTEX Emissions	2.8968	69.523	12.6880

EQUIPMENT REPORTS:

CONDENSER AND COMBUSTION DEVICE

Condenser Outlet Temperature:	78.00	deg. F
Condenser Pressure:	13.20	psia
Condenser Duty:	1.90e-002	MM BTU/hr
Hydrocarbon Recovery:	0.26	bbls/day
Produced Water:	0.31	bbls/day
Ambient Temperature:	36.50	deg. F
Excess Oxygen:	0.00	%
Combustion Efficiency:	98.00	%
Supplemental Fuel Requirement:	1.90e-002	MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	1.99%	98.01%
Propane	1.97%	98.03%
Isobutane	1.93%	98.07%
n-Butane	1.89%	98.11%
Isopentane	1.68%	98.32%
n-Pentane	1.73%	98.27%
n-Hexane	1.26%	98.74%
Cyclohexane	1.09%	98.91%
Heptanes	0.73%	99.27%
Methylcyclohexane	0.70%	99.30%
2,2,4-Trimethylpentane	0.72%	99.28%
Benzene	0.94%	99.06%
Toluene	0.43%	99.57%
Ethylbenzene	0.14%	99.86%
Xylenes	0.12%	99.88%
C8+ Heavies	0.00%	100.00%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25	
Calculated Dry Gas Dew Point:	2.48	lbs. H2O/MMSCF
Temperature:	65.0	deg. F
Pressure:	240.0	psig
Dry Gas Flow Rate:	1.9100	MMSCF/day
Glycol Losses with Dry Gas:	0.0014	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	61.63	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	8.49	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	4.02%	95.98%
Carbon Dioxide	99.80%	0.20%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.95%	0.05%
Propane	99.89%	0.11%
Isobutane	99.82%	0.18%
n-Butane	99.74%	0.26%
Isopentane	99.68%	0.32%
n-Pentane	99.58%	0.42%
n-Hexane	99.11%	0.89%
Cyclohexane	96.20%	3.80%
Heptanes	97.90%	2.10%
Methylcyclohexane	94.77%	5.23%
2,2,4-Trimethylpentane	99.07%	0.93%
Benzene	69.84%	30.16%
Toluene	54.64%	45.36%
Ethylbenzene	37.21%	62.79%
Xylenes	27.23%	72.77%
C8+ Heavies	91.37%	8.63%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	54.39%	45.61%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.41%	99.59%
n-Pentane	0.43%	99.57%
n-Hexane	0.46%	99.54%
Cyclohexane	3.15%	96.85%
Heptanes	0.48%	99.52%
Methylcyclohexane	3.95%	96.05%
2,2,4-Trimethylpentane	1.40%	98.60%
Benzene	4.98%	95.02%
Toluene	7.87%	92.13%
Ethylbenzene	10.37%	89.63%
Xylenes	12.86%	87.14%
C8+ Heavies	11.82%	88.18%

STREAM REPORTS:

WET GAS STREAM

Temperature: 65.00 deg. F
Pressure: 254.70 psia
Flow Rate: 7.97e+004 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.30e-001	4.91e+000
Carbon Dioxide	7.62e-001	7.05e+001
Nitrogen	1.24e-001	7.28e+000
Methane	9.27e+001	3.12e+003
Ethane	4.22e+000	2.67e+002
Propane	1.18e+000	1.09e+002
Isobutane	2.64e-001	3.22e+001
n-Butane	2.32e-001	2.84e+001
Isopentane	1.03e-001	1.55e+001
n-Pentane	6.55e-002	9.93e+000
n-Hexane	7.75e-002	1.40e+001
Cyclohexane	1.85e-002	3.27e+000
Heptanes	4.39e-002	9.25e+000
Methylcyclohexane	2.79e-002	5.75e+000
2,2,4-Trimethylpentane	2.70e-003	6.47e-001
Benzene	1.12e-002	1.84e+000
Toluene	1.57e-002	3.04e+000
Ethylbenzene	4.99e-004	1.11e-001
Xylenes	5.49e-003	1.23e+000
C8+ Heavies	1.52e-002	5.43e+000
Total Components	100.00	3.71e+003

DRY GAS STREAM

Temperature: 65.00 deg. F
Pressure: 254.70 psia
Flow Rate: 7.96e+004 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.23e-003	1.98e-001
Carbon Dioxide	7.62e-001	7.03e+001
Nitrogen	1.24e-001	7.27e+000
Methane	9.28e+001	3.12e+003
Ethane	4.23e+000	2.66e+002
Propane	1.18e+000	1.09e+002

Isobutane	2.64e-001	3.21e+001
n-Butane	2.32e-001	2.83e+001
Isopentane	1.02e-001	1.55e+001
n-Pentane	6.53e-002	9.89e+000
n-Hexane	7.69e-002	1.39e+001
Cyclohexane	1.78e-002	3.14e+000
Heptanes	4.31e-002	9.06e+000
Methylcyclohexane	2.64e-002	5.45e+000
2,2,4-Trimethylpentane	2.68e-003	6.41e-001
Benzene	7.82e-003	1.28e+000
Toluene	8.58e-003	1.66e+000
Ethylbenzene	1.86e-004	4.14e-002
Xylenes	1.50e-003	3.34e-001
C8+ Heavies	1.39e-002	4.96e+000
Total Components	100.00	3.70e+003

LEAN GLYCOL STREAM

Temperature: 65.00 deg. F
Flow Rate: 6.66e-001 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.84e+001	3.69e+002
Water	1.50e+000	5.63e+000
Carbon Dioxide	3.82e-012	1.43e-011
Nitrogen	2.13e-014	7.98e-014
Methane	3.05e-018	1.14e-017
Ethane	1.57e-008	5.87e-008
Propane	1.25e-009	4.67e-009
Isobutane	4.69e-010	1.76e-009
n-Butane	4.80e-010	1.80e-009
Isopentane	6.66e-005	2.50e-004
n-Pentane	5.64e-005	2.11e-004
n-Hexane	1.67e-004	6.26e-004
Cyclohexane	1.09e-003	4.10e-003
Heptanes	2.60e-004	9.76e-004
Methylcyclohexane	3.34e-003	1.25e-002
2,2,4-Trimethylpentane	2.45e-005	9.18e-005
Benzene	7.76e-003	2.91e-002
Toluene	3.14e-002	1.18e-001
Ethylbenzene	2.16e-003	8.10e-003
Xylenes	3.51e-002	1.32e-001
C8+ Heavies	1.69e-002	6.34e-002
Total Components	100.00	3.75e+002

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 65.00 deg. F
Pressure: 254.70 psia
Flow Rate: 6.92e-001 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.53e+001	3.69e+002
Water	2.67e+000	1.03e+001
Carbon Dioxide	4.99e-002	1.93e-001
Nitrogen	1.53e-003	5.94e-003
Methane	6.57e-001	2.55e+000
Ethane	8.07e-002	3.13e-001
Propane	4.95e-002	1.92e-001
Isobutane	2.10e-002	8.13e-002
n-Butane	2.39e-002	9.27e-002
Isopentane	1.57e-002	6.09e-002
n-Pentane	1.27e-002	4.93e-002
n-Hexane	3.49e-002	1.35e-001
Cyclohexane	3.37e-002	1.30e-001
Heptanes	5.21e-002	2.02e-001
Methylcyclohexane	8.19e-002	3.17e-001
2,2,4-Trimethylpentane	1.70e-003	6.57e-003
Benzene	1.51e-001	5.84e-001
Toluene	3.86e-001	1.50e+000
Ethylbenzene	2.02e-002	7.81e-002
Xylenes	2.64e-001	1.02e+000

Component	Conc. (vol%)	Loading (lb/hr)
C8+ Heavies	1.39e-001	5.37e-001
Total Components	100.00	3.87e+002

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.85e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	5.38e+001	4.72e+000
Carbon Dioxide	9.02e-001	1.93e-001
Nitrogen	4.36e-002	5.94e-003
Methane	3.26e+001	2.55e+000
Ethane	2.14e+000	3.13e-001
Propane	8.93e-001	1.92e-001
Isobutane	2.87e-001	8.13e-002
n-Butane	3.28e-001	9.27e-002
Isopentane	1.73e-001	6.06e-002
n-Pentane	1.40e-001	4.91e-002
n-Hexane	3.21e-001	1.34e-001
Cyclohexane	3.08e-001	1.26e-001
Heptanes	4.12e-001	2.01e-001
Methylcyclohexane	6.37e-001	3.05e-001
2,2,4-Trimethylpentane	1.17e-002	6.48e-003
Benzene	1.46e+000	5.55e-001
Toluene	3.08e+000	1.38e+000
Ethylbenzene	1.36e-001	7.00e-002
Xylenes	1.73e+000	8.93e-001
C8+ Heavies	5.71e-001	4.73e-001
Total Components	100.00	1.24e+001

CONDENSER PRODUCED WATER STREAM

Temperature: 78.00 deg. F
Flow Rate: 9.17e-003 gpm

Component	Conc. (wt%)	Loading (lb/hr)	(ppm)
Water	9.99e+001	4.59e+000	999483.
Carbon Dioxide	2.88e-003	1.32e-004	29.
Nitrogen	1.73e-006	7.93e-008	0.
Methane	1.59e-003	7.27e-005	16.
Ethane	2.55e-004	1.17e-005	3.
Propane	1.05e-004	4.83e-006	1.
Isobutane	2.52e-005	1.16e-006	0.
n-Butane	3.95e-005	1.81e-006	0.
Isopentane	1.73e-005	7.94e-007	0.
n-Pentane	1.60e-005	7.34e-007	0.
n-Hexane	2.90e-005	1.33e-006	0.
Cyclohexane	1.55e-004	7.10e-006	2.
Heptanes	1.49e-005	6.82e-007	0.
Methylcyclohexane	1.19e-004	5.46e-006	1.
2,2,4-Trimethylpentane	3.04e-007	1.40e-008	0.
Benzene	2.07e-002	9.49e-004	207.
Toluene	2.10e-002	9.64e-004	210.
Ethylbenzene	2.73e-004	1.25e-005	3.
Xylenes	4.51e-003	2.07e-004	45.
C8+ Heavies	7.08e-008	3.25e-009	0.
Total Components	100.00	4.59e+000	1000000.

CONDENSER RECOVERED OIL STREAM

Temperature: 78.00 deg. F
Flow Rate: 7.57e-003 gpm

Component	Conc. (wt%)	Loading (lb/hr)
Water	3.28e-002	1.06e-003
Carbon Dioxide	9.04e-003	2.91e-004
Nitrogen	1.73e-004	5.59e-006
Methane	3.65e-002	1.18e-003

Ethane	2.71e-002	8.73e-004
Propane	1.02e-001	3.28e-003
Isobutane	9.40e-002	3.03e-003
n-Butane	1.55e-001	4.99e-003
Isopentane	3.00e-001	9.66e-003
n-Pentane	2.04e-001	6.57e-003
n-Hexane	1.55e+000	4.98e-002
Cyclohexane	1.78e+000	5.74e-002
Heptanes	3.95e+000	1.27e-001
Methylcyclohexane	6.15e+000	1.98e-001
2,2,4-Trimethylpentane	1.29e-001	4.15e-003
Benzene	9.13e+000	2.94e-001
Toluene	3.36e+001	1.08e+000
Ethylbenzene	2.03e+000	6.53e-002
Xylenes	2.60e+001	8.39e-001
C8+ Heavies	1.47e+001	4.72e-001
Total Components	100.00	3.22e+000

CONDENSER VENT STREAM

Temperature: 78.00 deg. F
Pressure: 13.20 psia
Flow Rate: 7.59e+001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.66e+000	1.32e-001
Carbon Dioxide	2.19e+000	1.93e-001
Nitrogen	1.06e-001	5.93e-003
Methane	7.93e+001	2.54e+000
Ethane	5.18e+000	3.12e-001
Propane	2.14e+000	1.88e-001
Isobutane	6.73e-001	7.83e-002
n-Butane	7.54e-001	8.77e-002
Isopentane	3.53e-001	5.10e-002
n-Pentane	2.95e-001	4.25e-002
n-Hexane	4.91e-001	8.46e-002
Cyclohexane	4.10e-001	6.90e-002
Heptanes	3.67e-001	7.35e-002
Methylcyclohexane	5.43e-001	1.07e-001
2,2,4-Trimethylpentane	1.02e-002	2.33e-003
Benzene	1.66e+000	2.60e-001
Toluene	1.60e+000	2.95e-001
Ethylbenzene	2.23e-002	4.73e-003
Xylenes	2.51e-001	5.33e-002
C8+ Heavies	2.78e-003	9.47e-004
Total Components	100.00	4.58e+000

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.43e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	8.43e+001	5.09e-002
Ethane	5.51e+000	6.23e-003
Propane	2.27e+000	3.77e-003
Isobutane	7.16e-001	1.57e-003
n-Butane	8.02e-001	1.75e-003
Isopentane	3.75e-001	1.02e-003
n-Pentane	3.13e-001	8.51e-004
n-Hexane	5.22e-001	1.69e-003
Cyclohexane	4.36e-001	1.38e-003
Heptanes	3.90e-001	1.47e-003
Methylcyclohexane	5.77e-001	2.13e-003
2,2,4-Trimethylpentane	1.08e-002	4.66e-005
Benzene	1.77e+000	5.19e-003
Toluene	1.70e+000	5.90e-003
Ethylbenzene	2.37e-002	9.46e-005
Xylenes	2.67e-001	1.07e-003
C8+ Heavies	2.95e-003	1.89e-005
Total Components	100.00	8.51e-002

LINN OPERATING, INC.
SCC2 - Tank, LPS and EG Pump P3-P4 Combustor Emission Calculations

Emission Assumptions

		NOx Emission Factor =	0.14	lb/MMBtu	WDEQ O&G Guidance
		CO Emission Factor =	0.035	lb/MMBtu	WDEQ O&G Guidance
SCC2	T1-T2	Gas Throughput to Combustor =	24	scf/hr	[Gas Throughput from ProMax]
SCC2	T3	Gas Throughput to Combustor =	2	scf/hr	[Gas Throughput from ProMax]
SCC2	LPS	Gas Throughput to Combustor =	122	scf/hr	[Gas Throughput from ProMax]
SCC2	P3-P4	Gas Throughput to Combustor =	321	scf/hr	[Pump Specifications]
		Combustor Pilot Gas =	93	scf/hr	[Conservative Estimate]
		Natural Gas Heating Value =	1456	Btu/scf	[From ProMax LPS vent stream]

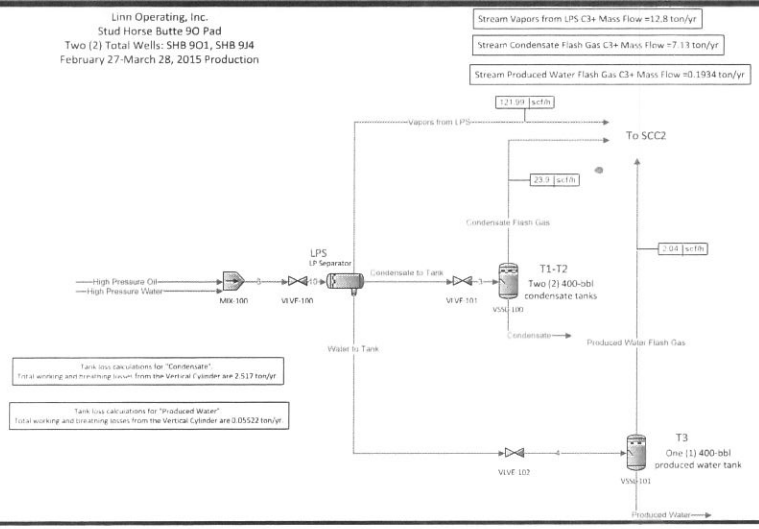
			NOx (tpy)	CO (tpy)	Number of Units	Hours per Year
SCC2	T1-T2	Combustor Emissions =	0.02	0.01	2	8760
SCC2	T3	Combustor Emissions =	0.00	0.00	1	8760
SCC2	LPS	Combustor Emissions =	0.11	0.03	1	8760
SCC2	P3-P4	Combustor Emissions =	0.04	0.01	2	8760
		Pilot Gas Emissions =	0.08	0.02	1	
		Total Combustor Emissions =	**0.25**	**0.06**		

Notes:

Emission factors for NOx and CO from combustors from WDEQ O&G Guidance, March 2010

Flowsheet1
Plant Schematic

Client Name:	Linn Operating, Inc.	Job: LPS Model: LPS, T1-T3, SCC2 Emissions
Location:	Stud Horse Butte 9O Pad	
Flowsheet:	Flowsheet1	



* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Linn Operating, Inc.	Job: LPS Model: LPS, T1-T3, SCC2 Emissions
Location:	Stud Horse Butte 9O Pad	
Flowsheet:	Flowsheet1	

Connections

	Condensate	Condensate Flash Gas	Condensate to Tank	High Pressure Oil	High Pressure Water
From Block	VSSL-100	VSSL-100	LP Separator	--	--
To Block	--	--	VLVE-101	MIX-100	MIX-100

Stream Composition

Mole Fraction	Condensate %	Condensate Flash Gas %	Condensate to Tank %	High Pressure Oil %	High Pressure Water %
Carbon Dioxide	0.00845971	0.691839	0.0300527	0.169981 *	0 *
Nitrogen	1.10448E-05	0.00926356	0.0003034	0.0102989 *	0 *
Methane	0.110304	26.6668	0.94942	10.1404 *	0 *
Ethane	0.691301	25.2152	1.46619	3.51191 *	0 *
Propane	2.36066	23.4575	3.02726	3.90217 *	0 *
i-Butane	1.87706	6.8802	2.03515	2.07087 *	0 *
n-Butane	2.86083	7.26223	2.9999	2.91198 *	0 *
i-Pentane	2.92672	2.77425	2.9219	2.63301 *	0 *
n-Pentane	2.94857	2.05109	2.92021	2.59901 *	0 *
Cyclopentane	0	0	0	0 *	0 *
n-Hexane	7.87938	1.51479	7.67827	6.66087 *	0 *
Cyclohexane	0	0	0	0 *	0 *
Isohexane	0	0	0	0 *	0 *
Heptane	25.6047	1.57596	24.8455	21.407 *	0 *
Methylcyclohexane	0	0	0	0 *	0 *
2,2,4-Trimethylpentane	0.841659	0.0569334	0.816864	0.704023 *	0 *
Benzene	1.39077	0.254063	1.35485	1.20687 *	0 *
Toluene	5.7384	0.300721	5.56658	4.82537 *	0 *
Ethylbenzene	0.554317	0.00858444	0.537073	0.462449 *	0 *
m-Xylene	5.78456	0.0743675	5.60413	4.82347 *	0 *
n-Octane	10.0115	0.184828	9.701	8.33908 *	0 *
Nonane	7.23972	0.0419996	7.01229	6.02364 *	0 *
Helium	0	0	0	0 *	0 *
Ethyl Alcohol	0	0	0	0 *	0 *
Water	0.0133372	0.940845	0.042644	0 *	100 *
Decane	21.1577	0.0386099	20.4904	17.5976 *	0 *
C11	0	0	0	0 *	0 *
C12	0	0	0	0 *	0 *
C13	0	0	0	0 *	0 *
C14	0	0	0	0 *	0 *
C15	0	0	0	0 *	0 *
C16	0	0	0	0 *	0 *
C17	0	0	0	0 *	0 *

Mass Flow	Condensate lb/h	Condensate Flash Gas lb/h	Condensate to Tank lb/h	High Pressure Oil lb/h	High Pressure Water lb/h
Carbon Dioxide	0.00717737	0.0191518	0.0263292	0.17342 *	0 *
Nitrogen	5.9647E-06	0.000163231	0.000169196	0.00668817 *	0 *
Methane	0.0341135	0.269092	0.303205	3.77118 *	0 *
Ethane	0.400729	0.476914	0.877643	2.44802 *	0 *
Propane	2.00674	0.650631	2.65737	3.9889 *	0 *
i-Butane	2.10322	0.251537	2.35476	2.79028 *	0 *
n-Butane	3.20551	0.265504	3.47101	3.92358 *	0 *
i-Pentane	4.07074	0.125902	4.19664	4.40386 *	0 *
n-Pentane	4.10113	0.0930836	4.19421	4.347 *	0 *
Cyclopentane	0	0	0	0 *	0 *
n-Hexane	13.09	0.0821094	13.1721	13.3066 *	0 *
Cyclohexane	0	0	0	0 *	0 *
Isohexane	0	0	0	0 *	0 *
Heptane	49.4606	0.0993299	49.56	49.7261 *	0 *
Methylcyclohexane	0	0	0	0 *	0 *

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Linn Operating, Inc.	Job: LPS Model: LPS, T1-T3, SCC2 Emissions
Location:	Stud Horse Butte 9O Pad	
Flowsheet:	Flowsheet1	

Mass Flow	Condensate lb/h	Condensate Flash Gas lb/h	Condensate to Tank lb/h	High Pressure Oil lb/h	High Pressure Water lb/h
2,2,4-Trimethylpentane	1.85342	0.00409072	1.85751	1.86429 *	0 *
Benzene	2.09428	0.0124829	2.10676	2.18539 *	0 *
Toluene	10.1928	0.0174286	10.2103	10.3068 *	0 *
Ethylbenzene	1.13449	0.00057326	1.13507	1.13814 *	0 *
m-Xylene	11.839	0.00496619	11.844	11.8711 *	0 *
n-Octane	22.0464	0.0132801	22.0596	22.0823 *	0 *
Nonane	17.9003	0.00338827	17.9037	17.9096 *	0 *
Helium	0	0	0	0 *	0 *
Ethyl Alcohol	0	0	0	0 *	0 *
Water	0.004632	0.0106615	0.0152935	0 *	1763.67 *
Decane	58.0338	0.00345546	58.0373	58.0435 *	0 *
C11	0	0	0	0 *	0 *
C12	0	0	0	0 *	0 *
C13	0	0	0	0 *	0 *
C14	0	0	0	0 *	0 *
C15	0	0	0	0 *	0 *
C16	0	0	0	0 *	0 *
C17	0	0	0	0 *	0 *

Stream Properties

Property	Units	Condensate	Condensate Flash Gas	Condensate to Tank	High Pressure Oil	High Pressure Water
Temperature	°F	66.5345	66.5345	70.102	70 *	70 *
Pressure	psia	11.76	11.76 *	41.76	261.76 *	261.76 *
Std Vapor Volumetric Flow	MMSCFD	0.0175577	0.00057288	0.0181306	0.0211133	0.891624
Std Liquid Volumetric Flow	sgpm	0.57106	0.0102872	0.581347	0.624587 *	3.52571 *
Gross Ideal Gas Heating Value	Btu/ft^3	5707.89	2167.2	5596.02	5014.76	50.31

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Linn Operating, Inc.	Job: LPS Model: LPS, T1-T3, SCC2 Emissions
Location:	Stud Horse Butte 9O Pad	
Flowsheet:	Flowsheet1	

Connections

	Produced Water	Produced Water Flash Gas	Vapors from LPS	Water to Tank	3
From Block	VSSL-101	VSSL-101	LP Separator	LP Separator	VLVE-101
To Block	--	--	--	VLVE-102	VSSL-100

Stream Composition

Mole Fraction	Produced Water %	Produced Water Flash Gas %	Vapors from LPS %	Water to Tank %	3 %
Carbon Dioxide	0.00092764	2.23495	0.719785	0.00105043	0.0300527
Nitrogen	3.74826E-07	0.0384501	0.0716332	2.48823E-06	0.0003034
Methane	0.00124571	62.1669	65.8275	0.00466266	0.94942
Ethane	0.000394516	16.6363	15.8477	0.00130891	1.46619
Propane	0.000284401	10.4248	9.13236	0.000857388	3.02726
i-Butane	1.07227E-05	1.14439	2.30855	7.3624E-05	2.03515
n-Butane	4.44436E-05	2.18007	2.37217	0.00016427	2.9999
i-Pentane	8.73657E-06	0.610535	0.880578	4.22944E-05	2.9219
n-Pentane	6.11356E-06	0.439783	0.649528	3.02861E-05	2.92021
Cyclopentane	0	0	0	0	0
n-Hexane	7.34658E-07	0.139684	0.482908	8.4124E-06	7.67827
Cyclohexane	0	0	0	0	0
Isohexane	0	0	0	0	0
Heptane	1.18529E-06	0.179763	0.512443	1.10659E-05	24.8455
Methylcyclohexane	0	0	0	0	0
2,2,4-Trimethylpentane	5.67731E-10	0.000783407	0.0184406	4.36279E-08	0.816864
Benzene	0.000748563	0.265324	0.0806943	0.000763106	1.35485
Toluene	0.000733296	0.314444	0.0972852	0.000750539	5.56658
Ethylbenzene	1.9756E-05	0.00906015	0.00284374	2.02529E-05	0.537073
m-Xylene	0.000176	0.0787266	0.0247406	0.000180318	5.60413
n-Octane	5.37236E-08	0.013455	0.0614808	7.93282E-07	9.701
Nonane	3.09913E-08	0.00478757	0.0142569	2.9414E-07	7.01229
Helium	0	0	0	0	0
Ethyl Alcohol	0	0	0	0	0
Water	99.9954	3.11498	0.88161	99.9901	0.042644
Decane	1.10799E-08	0.00282005	0.0134584	1.66084E-07	20.4904
C11	0	0	0	0	0
C12	0	0	0	0	0
C13	0	0	0	0	0
C14	0	0	0	0	0
C15	0	0	0	0	0
C16	0	0	0	0	0
C17	0	0	0	0	0

Mass Flow	Produced Water lb/h	Produced Water Flash Gas lb/h	Vapors from LPS lb/h	Water to Tank lb/h	3 lb/h
Carbon Dioxide	0.0399674	0.00529305	0.10183	0.0452604	0.0263292
Nitrogen	1.02796E-05	5.79636E-05	0.00645073	6.82432E-05	0.000169196
Methane	0.0195644	0.0536689	3.39474	0.0732333	0.303205
Ethane	0.0116135	0.0269196	1.53184	0.0385331	0.877643
Propane	0.0122774	0.0247375	1.29451	0.0370149	2.65737
i-Butane	0.000610134	0.00357939	0.431331	0.00418952	2.35476
n-Butane	0.00252889	0.00681876	0.443216	0.00934765	3.47101
i-Pentane	0.000617091	0.00237046	0.204233	0.00298755	4.19664
n-Pentane	0.00043182	0.0017075	0.150645	0.00213932	4.19421
Cyclopentane	0	0	0	0	0
n-Hexane	6.19795E-05	0.000647772	0.133775	0.000709751	13.1721
Cyclohexane	0	0	0	0	0

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Linn Operating, Inc.	Job: LPS Model: LPS, T1-T3, SCC2 Emissions
Location:	Stud Horse Butte 9O Pad	
Flowsheet:	Flowsheet1	

Mass Flow	Produced Water lb/h	Produced Water Flash Gas lb/h	Vapors from LPS lb/h	Water to Tank lb/h	3 lb/h
Isohexane	0	0	0	0	0
Heptane	0.000116274	0.000969321	0.165063	0.0010856	49.56
Methylcyclohexane	0	0	0	0	0
2,2,4-Trimethylpentane	6.34887E-08	4.81564E-06	0.00677139	4.87913E-06	1.85751
Benzene	0.0572433	0.00111529	0.0202623	0.0583586	2.10676
Toluene	0.0661454	0.00155911	0.0288148	0.0677045	10.2103
Ethylbenzene	0.00205333	5.17618E-05	0.000970509	0.00210509	1.13507
m-Xylene	0.0182926	0.000449775	0.00844343	0.0187423	11.844
n-Octane	6.00785E-06	8.27089E-05	0.0225758	8.87167E-05	22.0596
Nonane	3.8913E-06	3.30432E-05	0.00587797	3.69345E-05	17.9037
Helium	0	0	0	0	0
Ethyl Alcohol	0	0	0	0	0
Water	1763.6	0.00301987	0.0510559	1763.6	0.0152935
Decane	1.54335E-06	2.15923E-05	0.0061556	2.31356E-05	58.0373
C11	0	0	0	0	0
C12	0	0	0	0	0
C13	0	0	0	0	0
C14	0	0	0	0	0
C15	0	0	0	0	0
C16	0	0	0	0	0
C17	0	0	0	0	0

Stream Properties

Property	Units	Produced Water	Produced Water Flash Gas	Vapors from LPS	Water to Tank	3
Temperature	°F	70.1708	70.1708	70.102	70.102	66.5345
Pressure	psia	11.76	11.76 *	41.76	41.76	11.76
Std Vapor Volumetric Flow	MMSCFD	0.89163	4.90114E-05	0.00292775	0.891679	0.0181306
Std Liquid Volumetric Flow	sgpm	3.52625	0.000686919	0.0420074	3.52694	0.581347
Gross Ideal Gas Heating Value	Btu/ft^3	50.4079	1383.11	1456.27	50.4812	5596.02

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Linn Operating, Inc.	Job: LPS Model: LPS, T1-T3, SCC2 Emissions
Location:	Stud Horse Butte 9O Pad	
Flowsheet:	Flowsheet1	

Connections

	4	6	10		
From Block	VLVE-102	MIX-100	VLVE-100		
To Block	VSSL-101	VLVE-100	LP Separator		

Stream Composition

Mole Fraction	4 %	6 %	10 %		
Carbon Dioxide	0.00105043	0.00393199	0.00393199		
Nitrogen	2.48823E-06	0.000238232	0.000238232		
Methane	0.00466266	0.234566	0.234566		
Ethane	0.00130891	0.0812372	0.0812372		
Propane	0.000857388	0.0902646	0.0902646		
i-Butane	7.3624E-05	0.0479032	0.0479032		
n-Butane	0.00016427	0.0673596	0.0673596		
i-Pentane	4.22944E-05	0.0609065	0.0609065		
n-Pentane	3.02861E-05	0.0601201	0.0601201		
Cyclopentane	0	0	0		
n-Hexane	8.4124E-06	0.154078	0.154078		
Cyclohexane	0	0	0		
Isohexane	0	0	0		
Heptane	1.10659E-05	0.495185	0.495185		
Methylcyclohexane	0	0	0		
2,2,4-Trimethylpentane	4.36279E-08	0.0162854	0.0162854		
Benzene	0.000763106	0.0279171	0.0279171		
Toluene	0.000750539	0.11162	0.11162		
Ethylbenzene	2.02529E-05	0.0106973	0.0106973		
m-Xylene	0.000180318	0.111576	0.111576		
n-Octane	7.93282E-07	0.192899	0.192899		
Nonane	2.9414E-07	0.139338	0.139338		
Helium	0	0	0		
Ethyl Alcohol	0	0	0		
Water	99.9901	97.6868	97.6868		
Decane	1.66084E-07	0.407065	0.407065		
C11	0	0	0		
C12	0	0	0		
C13	0	0	0		
C14	0	0	0		
C15	0	0	0		
C16	0	0	0		
C17	0	0	0		

Mass Flow	4 lb/h	6 lb/h	10 lb/h		
Carbon Dioxide	0.0452604	0.17342	0.17342		
Nitrogen	6.82432E-05	0.00668817	0.00668817		
Methane	0.0732333	3.77118	3.77118		
Ethane	0.0385331	2.44802	2.44802		
Propane	0.0370149	3.9889	3.9889		
i-Butane	0.00418952	2.79028	2.79028		
n-Butane	0.00934765	3.92358	3.92358		
i-Pentane	0.00298755	4.40386	4.40386		
n-Pentane	0.00213932	4.347	4.347		
Cyclopentane	0	0	0		
n-Hexane	0.000709751	13.3066	13.3066		
Cyclohexane	0	0	0		
Isohexane	0	0	0		
Heptane	0.0010856	49.7261	49.7261		
Methylcyclohexane	0	0	0		
2,2,4-Trimethylpentane	4.87913E-06	1.86429	1.86429		
Benzene	0.0583586	2.18539	2.18539		
Toluene	0.0677045	10.3068	10.3068		

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	Linn Operating, Inc.	Job: LPS Model: LPS, T1-T3, SCC2 Emissions
Location:	Stud Horse Butte 9O Pad	
Flowsheet:	Flowsheet1	

Mass Flow	4 lb/h	6 lb/h	10 lb/h		
Ethylbenzene	0.00210509	1.13814	1.13814		
m-Xylene	0.0187423	11.8711	11.8711		
n-Octane	8.87167E-05	22.0823	22.0823		
Nonane	3.69345E-05	17.9096	17.9096		
Helium	0	0	0		
Ethyl Alcohol	0	0	0		
Water	1763.6	1763.67	1763.67		
Decane	2.31356E-05	58.0435	58.0435		
C11	0	0	0		
C12	0	0	0		
C13	0	0	0		
C14	0	0	0		
C15	0	0	0		
C16	0	0	0		
C17	0	0	0		

Stream Properties

Property	Units	4	6	10		
Temperature	°F	70.1708	70.0809	70.102		
Pressure	psia	11.76 *	261.76	41.76 *		
Std Vapor Volumetric Flow	MMSCFD	0.891679	0.912738	0.912738		
Std Liquid Volumetric Flow	sgpm	3.52694	4.15029	4.15029		
Gross Ideal Gas Heating Value	Btu/ft^3	50.4812	165.147	165.147		

Remarks

LINN OPERATING, INC.
Process Heater Emission Calculations

Emission Assumptions

NOx Emission Factor, adjusted for heating value =	109	lb/MMscf	[AP-42, Chapter 1.4]
CO Emission Factor, adjusted for heating value =	92	lb/MMscf	[AP-42, Chapter 1.4]
VOC Emission Factor, adjusted for heating value =	6	lb/MMscf	[AP-42, Chapter 1, Table 1.4-2]
Natural Gas Heating Value =	1113	Btu/scf	[Field Average]
Natural Gas Heating Value =	1020	Btu/scf	AP-42 default value

				Number of Units
REB1	Dehy Reboiler =	0.13	MMBtu/hr	1
EGH1	EG Bath Heater =	0.25	MMBtu/hr	1

Reboiler Separtor Hours Operated Per Year =	8760.00
Other Heater Hours Operated Per Year =	4380.00

		N0x (tpy)	VOC (tpy)	CO (tpy)
0.13 MMBtu/hr	Dehy Reboiler =	**0.05**	**0.003**	**0.05**
0.25 MMBtu/hr	EG Bath Heater =	**0.05**	**0.003**	**0.05**
Total Process Heater Emissions =		**0.11**	**0.01**	**0.09**

LINN OPERATING, INC.
Pneumatics Emissions Estimation
Calculation Details - Ethylene Glycol Pumps P3-P4

Sandpiper pump (scfh)	321
Hours/year	4380
Motive Gas Density (lb/ft^3)	0.047
Number of pumps	2
Gas Vented (tpy)	66.53
% VOC	9.61%
% HAPs	0.76%

Uncontrolled VOCs (tpy)	**6.40**
Uncontrolled HAPs (tpy)	**0.51**
Control Efficiency (%)	**98.0%**
Controlled VOCs (tpy)[1]	**0.128**
Controlled HAPs (tpy)[1]	**0.010**

7700 SCFD (Process Flow Diagram)
321 SCFH

Calculations:

Pump Rate (scf/hour) * Number of Pumps / 23.8 ft^3/lb * 8760 hrs/yr / 2000 lbs-ton = Amount of gas vented (tons/yr)
%VOC was calculated from the mol % wet gas average of four wells, converted to weight percent, VOC = All C3+ components
% VOC of gas x pneumatic gas vented (tons/yr) = ton/yr of VOC emitted

Notes:
[1]All pneumatic heat trace, heat medium, or glycol circulation pumps are routed through combustor or an equivalent device to achieve 98% destruction efficiency

LINN OPERATING, INC.
Condensate Truck Loading

From AP-42, Chapter 5.2 - Transportation and Marketing of Petroleum Liquids

L_L = 12.46 SPM / T

Where,

L_L = Loading Loss, lb/1000 gals of liquid loaded (Total Hydrocarbons)
S = Saturation Factor
P = True Vapor Pressure of Liquid Loaded, psia
M = Molecular Weight of Vapors, lb/lb-mol
T = Temperature of Bulk Liquid Loaded, ^{o}R

Condensate Truck Loading Assumptions

L_L =	3.83	Loading Losses, lb/1000 gal liquid loaded
S =	0.6	submerged loading, dedicated normal service
	13.2	Reid Vapor Pressure, psia
P =	5.74	True Vapor Pressure, psia
M =	44.7	Mol Wt of Vapors, lb/lbmol
T =	500	Temp of liquid loaded, ^{o}R, (50 + 460) = 510 ^{o}R

Calculated VOC Wt. % of THC Vapors =	83.83	wt. %
Calculated HAP WT. % of THC Vapors =	2.60	wt. %

Average Daily Loadout =	19.58	bbls/day
Annual Production =	7,147	bbls/year
Annual Production =	300,161	gals/year
Annual Production =	300	1,000 gals/year
Tank Truck Capacity =	8000	gallons
Annual Unloading =	37.5	trucks/yr
For 8000 gal Truck =	30.67	lbs/truck

E =	**0.48**	**TPY VOC**
E =	**0.01**	**TPY HAPs**

LINN OPERATING, INC.

Truck Loading Vapor Pressure and Speciation

Component	Molecular Weight (lb/lb-mole)	Higher Heating Value (Btu/scf)	Stable Oil Composition[a] (Mole %)	Truck Loading Vapor Composition [b] (Mole %)	(Wt. %)
Carbon Dioxide[c]	44.01	0	0.0049	0.0000	0.0000
Nitrogen[c]	28.01	0	0.0074	0.0000	0.0000
Methane	16.04	1013	0.0195	15.8993	5.7090
Ethane	30.07	1792	0.3393	15.5472	10.4655
Propane	44.10	2590	2.6714	34.3820	33.9425
Isobutane	58.12	3363	2.2905	10.6497	13.8560
n-Butane	58.12	3370	3.9215	12.0761	15.7118
Isopentane	72.15	4008	4.1894	4.3333	6.9989
n-Pentane	72.15	4016	4.0726	3.0324	4.8978
n-Hexane	84.18	4762	5.1258	0.9706	1.8290
Hexanes	86.18	4482	6.5694	1.2439	2.3998
Heptanes	100.21	5503	25.4448	1.2859	2.8847
2,2,4-Trimethylpentane	114.23	6232	1.1654	0.0569	0.1456
Benzene	78.11	3751	1.594	0.1579	0.2761
Toluene	92.14	4484	5.538	0.1287	0.2656
Ethylbenzene	106.17	5222	0.4502	0.0030	0.0070
Xylenes (Total)	106.17	5230	5.4384	0.0315	0.0749
Octanes	114.23	6249	10.7282	0.1540	0.3937
Nonanes	128.26	6947	7.0690	0.0800	0.0862
Decanes	142.29	7711	13.3603	0.0176	0.0559
Total			100.0000	100.0000	100.0000

Liquid Bulk Temperature	40.00	F
Calculated True Vapor Pressure [d]	5.74	psia
Calculated Molecular Weight of Vapors [e]	44.67	lb/lb-mole
Calculated VOC Wt. % of Vapors	83.83	wt. %
Calculated HAP Wt. % of Vapors	2.60	wt. %
Calculated HHV of Vapors	2593.58	Btu/scf

Notes:

(a) Stable oil composition from site-specific oil analysis taken at the Cabrito 19F Pad on 2/26/2015 by Questar Applied Technology

(b) Vapor Composition (Mole %) = (Constituent TVP, psia) * (Consituent Mole Fraction in Stable Oil) / (Total Liquid TVP, psia)

Vapor Composition (Wt %) = (Constituent Mole Fraction) * (Consituent MW, lb/lb-mole) / (Total Vapor MW, lb/lb-mole)

(c) Although these constituents were detected in the samples they were not included in the calculations because a valid true vapor pressure at the bulk liquid tempature was not found in Mpbpwin v1.43

(d) True Vapor Pressure of Liquid (psia) = Σ (Constituent TVP, psia) * (Consituent Mole Fraction in Stable Oil). True vapor pressure of each constituent calculated using Mpbpwin v1.43.

(e) Molecular Weight of Vapors calculated based on Equation 1-22 of AP 42 Chapter 7.1

LINN OPERATING, INC.

Equipment Leak Emission Factors

Equipment Type	Equipment Service	Average Total HydroCarbon Emission Factors[1]	Speciated Fugitive Emission Factors (Estimated Weight Fractions)[2]						
		(lb/component-day)	VOC	C6+	Benzene	Toluene	Ethylbenzene	Xylenes	Total HAP
Valves	Gas	**0.2400**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.00044**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.1300**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0052**	N/A	N/A	6.24E-06	1.66E-06	5.20E-08	2.08E-07	8.16E-06
Pump Seals	Gas	**0.1300**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**NA**	NA	NA	NA	NA	NA	NA	NA
	Light Oil	**0.6900**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0013**	N/A	N/A	1.56E-06	4.16E-07	1.30E-08	5.20E-08	2.04E-06
Others: pressure relief valves, compressors, instruments, diaphrams, drains, hatches, meters, and vents.	Gas	**0.4700**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0017**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.4000**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.7400**	N/A	N/A	8.88E-04	2.37E-04	7.40E-06	2.96E-05	1.16E-03
Connectors	Gas	**0.0110**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0004**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0110**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0058**	N/A	N/A	6.96E-06	1.86E-06	5.80E-08	2.32E-07	9.11E-06
Flanges	Gas	**0.0210**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.000021**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0058**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.00015**	N/A	N/A	1.80E-07	4.80E-08	1.50E-09	6.00E-09	2.36E-07
Open-Ended Lines	Gas	**0.1100**	3.50E-02	3.38E-03	2.30E-04	3.90E-04	2.00E-05	1.00E-04	4.12E-03
	Heavy Oil	**0.0074**	3.00E-02	7.52E-03	9.35E-03	3.44E-03	5.10E-04	3.72E-03	2.45E-02
	Light Oil	**0.0740**	2.92E-01	2.43E-02	2.70E-04	7.50E-04	1.70E-04	3.60E-04	2.59E-02
	Water/Oil	**0.0130**	N/A	N/A	1.56E-05	4.16E-06	1.30E-07	5.20E-07	2.04E-05

Speciated Fugitive Emission Factors
(Estimated weight fractions of THC emissions in each category

Equipment Service	Speciated Fugitive Emission Factors (Estimated weight fractions of THC emissions)[2]							
	Methane	NMHC	VOC	C6+	Benzene	Toluene	Ethylbenzene	Xylenes
Gas Production	0.92	0.08	0.035	0.00338	0.00023	0.00039	0.00002	0.0001
Heavy Oil	0.942	0.058	0.03	0.00752	0.00935	0.00344	0.00051	0.00372
Light Oil	0.613	0.387	0.292	0.0243	0.00027	0.00075	0.00017	0.00036

HAP (BTEX) Fugitive Emission Speciation Factors Used for Water/Oil

Compound	Speciation Factor[3] (lb HAP/lb TOC)
Benzene	0.0012
Toluene	0.00032
Ethylbenzene	0.00001
Xylenes (m,p,o)	0.00004

LINN OPERATING, INC.

Equipment Leak Emissions

Component Count	Total HydroCarbon Emissions			Total VOC Emissions [4]			Total HAP Emissions [4]		
	lb/day	lb/mo.	ton/yr	lb/day	lb/mo.	ton/yr	lb/day	lb/mo.	ton/yr
94	22.6	686.2	4.1	0.790	24.0	0.144	0.093	2.8	0.017
26	3.38	102.8	0.6	0.987	30.0	0.180	0.087	2.7	0.016
19	0.10	3.0	0.0	N/A			0.000	0.0	0.000
38	17.9	543.2	3.3	0.625	19.0	0.114	0.074	2.2	0.013
3	1.2	36.5	0.2	0.350	10.7	0.064	0.031	0.9	0.006
2	1.5	45.0	0.3	N/A			0.002	0.1	0.000
583	6.4	195.1	1.2	0.224	6.8	0.041	0.026	0.8	0.005
205	2.3	68.6	0.4	0.658	20.0	0.120	0.058	1.8	0.011
90	0.5	15.9	0.1	N/A			0.000	0.0	0.000
27	0.6	17.2	0.1	0.020	0.6	0.004	0.002	0.1	0.000
6	0.0	1.1	0.0	0.010	0.3	0.002	0.001	0.0	0.000
64	0.0	0.3	0.0	N/A			0.000	0.0	0.000
19	2.1	63.6	0.4	0.073	2.2	0.013	0.009	0.3	0.002
2	0.1	4.5	0.0	0.043	1.3	0.008	0.004	0.1	0.001
5	0.1	2.0	0.0				0.000	0.0	0.000
Total	**56.4**	**1714.6**	**10.3**	**3.781**	**115.0**	**0.69**	**0.387**	**11.8**	**0.07**

Sample Calculations: TOC emissions (tpy) = [N, (Component Count)] * [THC EF per equipment type and service category, (lb/component-day)] * [365, (days in a year)] / [2000, (lbs/ton)]
VOC emissions (tpy) = [TOC emissions per equipment service, (tpy)] * [VOC Speciated Fugitive EF per equipment service, (weight fraction)]
HAP emissions (tpy) = [TOC emissions per equipment service, (tpy)] * [Sum of HAP speciated EF's per equipment service, (sum of weight fractions)]

References:

[1] EPA Protocol for Equipment Leak Emission Estimates, November 1995 (EPA-453/R-95-017) Table 2-4, Page 2-15.

[2] Oil and Gas Production Facilities, Chapter 6, section 2 Permitting Guidance, WDEQ, Air Quality Division, Fugitive Emissions Pg. 71 of 81

[3] Gas Research Institute (GRI) Technical Reference Manual for GRI-HAPCalc, Software for Estimating Emissions of Hazardous Air Pollutants and Criteria Air Pollutants from Natural Gas Industry Operations, GRI-96/0346

[4] Based on representative component count for each piece of equipment.

LINN OPERATING, INC.
Liquid Level Controllers (LLC)

(Low/No-Bleed):		
Norriseal 1001A Snap Acting Controllers Rate:	0.282	scfh
Total Controllers:	5	LLCs
Hours of Operation/year:	8760	hours
Estimated Motive Gas Density:	0.047	lb/ft^3
Gas Vented (tpy)	0.29	
% VOC	9.61%	
% HAPs	0.76%	
VOC Emissions (tpy):	**0.03**	
HAP Emissions (tpy):	**0.002**	

Linn Operating - SHB 9O PAD

Estimated Stack Flow Rate For SCC1

Dehy Control Device

Fuel Gas Components	Moles of Component / 100 Moles Fuel @ 100% Total Air	Required for Combustion		Stack Diameter (Inches)
		O2	Dry Air	20
O2	1.09			Stack Diameter (Feet)
CO2	86.21			
CH4	6.18	12.37	58.92	1.7
C2H6	2.63	9.21	43.86	Stack Area (Square Feet)
C3H8	1.58	7.92	37.71	
C4H10	0.61	3.94	18.76	2.18
C5H12	0.58	4.60	21.93	Stack Velocity (Std.Ft/Sec)
C6H14	0.44	4.23	20.13	
N2	0.00			2.2
SUM	98.2	42.3	201.3	Stack Velocity (Ft/Sec)
Less O2 in Fuel (deduct)		1.09	5.20	
Required @ 100% air		**41.2**	**196.1**	**5.3**

Fuel Gas Density	371.76	scf/mole fuel gas
Calculated HHV	215.45	btu/scf

Percent Excess Air (%)	Required for Combustion	
	O2	Dry Air
100.00	41.16	196.11
Excess Air	--	0.00
Excess O2	0.00	--

Stack Temp (°F)	**1,200.00**

Flue Gas Components	Moles Air / 100 Moles Fuel @ Percent Excess Air	% by Volume Dry Basis
CO2	110.4	41.6
H2O	40.3	
N2	154.9	58.4
O2	0.0	0.0
Wet	305.6	
Dry	265.3	100.0

Conditions:	Ambient	Standard	Units
Temp	**34.4**	**60.0**	°F
Pressure (Elevation)	**11.3**	**14.7**	psia

Fuel Rate			Flue Gas Flow Rate	
Load (MMBtu / hr)	(scf / hr) @ calc. HHV btu/scf	Moles fuel Per Hour	Moles Dry Air Per Hour	dscf / min @ 60 degrees F
1.375	6,382	17.17	46	**282**

Fuel Usage:	**55.91**	**MMSCF/YR Fuel**	**Actual Flow Rate**
			693.1

All calculations and constants are from Babcock & Wilcox "STEAM / it's generation and use"

Linn Operating - SHB 9O PAD

Estimated Stack Flow Rate For SCC2

Tank Control Device

Fuel Gas Components	Moles of Component / 100 Moles Fuel @ 100% Total Air	Required for Combustion		Stack Diameter (Inches)
		O2	Dry Air	48
O2	0.00			Stack Diameter (Feet)
CO2	0.82			
CH4	59.51	119.01	566.98	4.0
C2H6	17.37	60.79	289.60	Stack Area (Square Feet)
C3H8	11.42	57.12	272.15	
C4H10	6.16	40.01	190.63	12.56
C5H12	2.04	16.32	77.77	Stack Velocity (Std.Ft/Sec)
C6H14	0.75	7.13	33.95	
N2	0.06			1.4
SUM	98.1	300.4	1,431.1	Stack Velocity (Ft/Sec)
Less O2 in Fuel (deduct)		0.00	0.00	
Required @ 100% air		300.4	1,431.1	3.5

Fuel Gas Density	368.82	scf/mole fuel gas
Calculated HHV	1534.86	btu/scf

Percent Excess Air (%)	Required for Combustion	
	O2	Dry Air
100.00	300.38	1,431.07
Excess Air	--	0.00
Excess O2	0.00	--

Stack Temp (°F)	1,200.00

Flue Gas Components	Moles Air / 100 Moles Fuel @ Percent Excess Air	% by Volume Dry Basis
CO2	168.7	13.0
H2O	295.1	
N2	1130.6	87.0
O2	0.0	0.0
Wet	1594.3	
Dry	1299.3	100.0

Conditions:	Ambient	Standard	Units
Temp	34.4	60.0	°F
Pressure (Elevation)	11.3	14.7	psia

Fuel Rate			Flue Gas Flow Rate	
Load (MMBtu / hr)	(scf / hr) @ calc. HHV btu/scf	Moles fuel Per Hour	Moles Dry Air Per Hour	dscf / min @ 60 degrees F
7.7	5,017	13.60	177	1,086
Fuel Usage:	43.95	MMSCF/YR Fuel		Actual Flow Rate
				2665.8

All calculatins and constants are from Babcock & Wilcox "STEAM / it's generation and use"

Linn Operating - SHB 9O PAD

Estimated Stack Flow Rate For Heaters

One (1) - 0.125 MMBtu/hr Reboiler/EG heater

Fuel Gas Components	Moles of Component / 100 Moles Fuel @ 100% Total Air	Required for Combustion		Stack Diameter (Inches)
		O2	Dry Air	6
O2	**0.00**			**Stack Diameter (Feet)**
CO2	**0.52**			
CH4	**90.52**	181.04	862.49	0.5
C2H6	**5.30**	18.56	88.42	**Stack Area (Square Feet)**
C3H8	**1.79**	8.95	42.62	
C4H10	**0.82**	5.34	25.46	0.20
C5H12	**0.28**	2.20	10.49	**Stack Velocity (Std.Ft/Sec)**
C6H14	**0.15**	1.42	6.75	
N2	**0.47**			1.5
SUM	99.8	217.5	1,036.2	**Stack Velocity (Ft/Sec)**
Less O2 in Fuel (deduct)		0.00	0.00	
Required @ 100% air		**217.5**	**1,036.2**	**2.1**

Fuel Gas Density	**376.72**	**scf/mole fuel gas**
Calculated HHV	**1104.36**	**btu/scf**

Percent Excess Air (%)	Required for Combustion	
	O2	Dry Air
100.00	217.51	1,036.24
Excess Air	--	0.00
Excess O2	0.00	--

Stack Temp (°F)	**500.00**

Flue Gas Components	Moles Air / 100 Moles Fuel @ Percent Excess Air	% by Volume Dry Basis
CO2	112.6	12.1
H2O	232.6	
N2	819.1	87.9
O2	0.0	0.0
Wet	1164.3	
Dry	931.7	100.0

Conditions:	Ambient	Standard	Units
Temp	**34.4**	**60.0**	°F
Pressure (Elevation)	**11.3**	**14.7**	psia

Fuel Rate			Flue Gas Flow Rate	
Load (MMBtu / hr)	(scf / hr) @ calc. HHV btu/scf	Moles fuel Per Hour	Moles Dry Air Per Hour	dscf / min @ 60 degrees F
0.125	113	0.30	3	**18**
Fuel Usage:	**0.99**	**MMSCF/YR Fuel**		**Actual Flow Rate**
				24.9

All calculatins and constants are from Babcock & Wilcox "STEAM / it's generation and use"

Linn Operating - SHB 9O PAD

Estimated Stack Flow Rate For Heaters

One (1) - 0.250 MMBtu/hr EG Heater

Fuel Gas Components	Moles of Component / 100 Moles Fuel @ 100% Total Air	Required for Combustion		Stack Diameter (Inches)
		O2	Dry Air	6
O2	**0.00**			**Stack Diameter (Feet)**
CO2	**0.52**			
CH4	**90.52**	181.04	862.49	0.5
C2H6	**5.30**	18.56	88.42	**Stack Area (Square Feet)**
C3H8	**1.79**	8.95	42.62	
C4H10	**0.82**	5.34	25.46	0.20
C5H12	**0.28**	2.20	10.49	**Stack Velocity (Std.Ft/Sec)**
C6H14	**0.15**	1.42	6.75	
N2	**0.47**			3.0
SUM	99.8	217.5	1,036.2	**Stack Velocity (Ft/Sec)**
Less O2 in Fuel (deduct)		0.00	0.00	
Required @ 100% air		**217.5**	**1,036.2**	**4.2**

Fuel Gas Density	**376.72**	**scf/mole fuel gas**
Calculated HHV	**1104.36**	**btu/scf**

Percent Excess Air (%)	Required for Combustion	
	O2	Dry Air
100.00	217.51	1,036.24
Excess Air	--	0.00
Excess O2	0.00	--

Stack Temp (°F)	**500.00**

Flue Gas Components	Moles Air / 100 Moles Fuel @ Percent Excess Air	% by Volume Dry Basis
CO2	112.6	12.1
H2O	232.6	
N2	819.1	87.9
O2	0.0	0.0
Wet	1164.3	
Dry	931.7	100.0

Conditions:	Ambient	Standard	Units
Temp	**34.4**	**60.0**	°F
Pressure (Elevation)	**11.3**	**14.7**	psia

Fuel Rate			Flue Gas Flow Rate	
Load (MMBtu / hr)	(scf / hr) @ calc. HHV btu/scf	Moles fuel Per Hour	Moles Dry Air Per Hour	dscf / min @ 60 degrees F
0.25	226	0.60	6	**35**

Fuel Usage:	**1.98**	**MMSCF/YR Fuel**	**Actual Flow Rate**
			49.9

All calculatins and constants are from Babcock & Wilcox "STEAM / it's generation and use"